

An Empirical Investigation of Moral Injury in Combat Veterans

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My dissertation first began in one of the first years of graduate school, when Dr. Frazier and I attended the International Society of Traumatic Stress Studies conference. I told her excitedly about a talk on moral injury I attended, and she encouraged me to pick up “Achilles in Vietnam,” by Dr. Jonathan Shay, at the conference bookstore. I read the entire book on the flight back home and decided that moral injury would be my field of inquiry.

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Dedication

This dissertation is dedicated to Dr. Patricia Frazier. Being accepted into your lab during my undergraduate years was about the luckiest thing that could have happened to me. In my application to your lab for graduate school, I wrote that my goal was to be trained to think, write, and work as professionally and competently and smartly as you do. You have met my request far and away, and I now have my postgraduate career to keep striving toward your example. Thank you for your patience, kindness, good humor, and faith and trust in my potential to be a research psychologist. I will miss working together dearly, and will consider you my mentor for the rest of my career.

Abstract

The moral injury construct was proposed to identify and describe the deleterious impact of engaging in acts that transgress accepted boundaries of behavior during combat and that challenge one's sense of self as a good person. These acts, labeled "transgressive acts," are proposed to lead to a guilt and shame-based syndrome of posttraumatic stress disorder (PTSD) symptoms, demoralization, self-handicapping, and self-injury. Although the moral injury construct has been gaining clinical and popular attention in recent years, little empirical research on a frequently cited model of moral injury (Litz et al., 2009) has been conducted. The current study tested key tenets of this moral injury model using structural equation modeling (SEM) in a sample of combat-exposed male veterans ($N = 190$). Findings supported some assertions of this moral injury model. SEM supported the direct effect of transgressive acts on guilt, and the indirect effect of transgressive acts on suicidality and demoralization through guilt. An alternative configuration of moral injury wherein demoralization was a mechanism (not outcome) of moral injury fit the data adequately; transgressive acts had an indirect effect through demoralization on suicidality and PTSD. Limitations of the study include the use of cross-sectional data and limited measures of moral injury mechanisms and outcomes. We conclude with implications for future research for veterans experiencing moral injury.

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Introduction

Post-combat mental health research and practice have generally focused on posttraumatic stress disorder (PTSD), a fear-based disorder that results from exposure to life-threatening events (APA, 2013). However, clinical expertise (e.g., Haley, 1974) and research (e.g., Maguen et al., 2009) have identified how active participation in violent warfare, particularly killing or committing atrocities, may pose an even greater risk to veterans' psyches than exposure to life-threatening events. Clinical literature has described Vietnam veterans who withdrew from daily life and turned to alcohol and self-injury because of guilt over killing and committing atrocities (Singer, 2004). Psychologists who work with combat veterans have written that the "most disturbing images [for Vietnam veterans] are of particular encounters with the dead and dying; his harshest self-judgments emerge from these encounters and concern not only what he did or did not do, but his sense of the overall project he was a part of" (Yager et al., 1984, p. 327).

The corrosive long term effect of certain violent combat experiences has been described as "moral injury," because it results from participating in or bearing witness to acts that violate deeply held standards of behavior (Litz et al., 2009). The moral injury construct describes the shame- and guilt-based disturbances that some veterans experience after "transgressive acts"—that is, acts that involve a violation, or transgression, of accepted boundaries of behavior. The guilt and shame that develop after a transgressive act are proposed to lead to a host of outcomes collected under the "moral

injury” label—PTSD, demoralization, self-injury, self-handicapping, and loss of spirituality (Drescher et al., 2011; Litz et al., 2009).

The current study tested a model of moral injury informed by Litz and colleagues (2009) and other writers (Fontana & Rosenheck, 1999; Holowka et al., 2012; Shay, 1994) in a sample of combat-exposed male U.S. veterans. This study examined the prevalence of transgressive acts, risk factors for transgressive acts, the associations between transgressive acts and proposed moral injury outcomes, and proposed mediators of the relations between transgressive acts and moral injury outcomes. The assertions tested were whether transgressive acts are associated with moral injury outcomes; whether aggression, witnessing a close comrade’s death, and combat exposure confer a greater risk of transgressive acts; and whether guilt mediates the relation between transgressive acts and moral injury outcomes.

Before describing the current study and results in greater detail, I first review research on the prevalence of transgressive acts, along with research on risk and protective factors for exposure to transgressive acts. Then, I review the empirical and clinical literature on the relations between transgressive acts and moral injury outcomes (e.g., self-injury) as well as mechanisms of moral injury development (e.g., guilt).

Prevalence of Transgressive Acts

Transgressive acts may be acts of commission (e.g., killing), omission (e.g., failing to prevent an atrocity), or betrayal by a trusted authority figure (Litz et al., 2009; Shay, 1994). Some of these transgressive acts, such as killing an enemy combatant, can be justified in the context of war and still be morally injurious (Farnsworth et al., 2014).

The prevalence of transgressive acts likely varies across war eras, theaters, branches of military service, and types of event assessed. However, the prevalence of transgressive acts has not been systematically assessed in cohorts of veterans of any war. For a full review of research on the prevalence of transgressive acts, see Frankfurt and Frazier (2015; included in full in Appendix A).

The available data suggest that the most recent cohort of veterans from the Iraq and Afghanistan wars (i.e., Operation Iraqi Freedom [OIF] and Operation Enduring Freedom [OEF]) generally ran a high risk of having killed an enemy combatant or noncombatant/civilian, two signal transgressive acts (Hoge et al., 2004; Maguen et al., 2010). Across two samples, approximately 40-50% of OIF Soldiers and 65% of OIF Marines reported killing an enemy combatant (Hoge et al., 2004; Maguen et al., 2010). Additionally, 12-15% of OIF Soldiers and 28% of OIF Marines reported killing a noncombatant (Hoge et al., 2004). A RAND Corporation survey of OIF and OEF veterans found that 5% reported being directly responsible for deaths of civilians and 5% reported witnessing brutality toward civilians (Schell & Marshall, 2008).

Vietnam War veterans, likewise, ran a high risk of having killed enemy combatants or witnessed or participated in atrocities (Currier, Holland, Jones, & Sheu, 2014; Maguen et al., 2009). Population-based estimates of transgressive acts were derived from the nationally-representative National Vietnam Veterans Readjustment Survey (NVVRS; Maguen et al., 2009). Approximately 41% of Vietnam veterans believed they killed an enemy combatant; 13% reported they were involved in a situation where a woman, child, or elder was injured or killed; and 7% reported they were

personally responsible for the death of a Vietnamese civilian. A reanalysis of the NVVRS data found that 41% of Vietnam veterans reported witnessing or participating in atrocities (Currier et al., 2014).

Risk and Protective Factors for Transgressive Acts

A number of risk (e.g., combat exposure) and protective factors (e.g., military training) for transgressive acts have been proposed, and a full review of these factors is currently under review (see Appendix A; also Frankfurt & Frazier, 2015). Research on three risk factors (combat exposure, witnessing the death of a comrade, and anger/aggression) is reviewed here because data on these three factors were available for examination in the current study.

Across five studies with OIF/OEF and Vietnam veterans, greater combat exposure was significantly correlated with increased risk of transgressive acts (Army, 2006; Dohrenwend et al., 2013; Hiley-Young et al., 1995; Maguen et al., 2009, 2010). For both OIF/OEF and Vietnam veterans, combat exposure was positively correlated with killing in combat (Maguen et al., 2009, 2010). Among Vietnam veterans, combat exposure was also positively correlated with participating in atrocities (Hiley-Young et al., 1995) and harming civilians (Dohrenwend et al., 2013).

Clinical literature suggests that witnessing the death of a close comrade confers a significant risk for then going on to commit transgressive acts (Shay, 1994). Veterans in PTSD treatment described descending into a “berserker” state of hyperviolence triggered by grief following the loss of a close buddy. “Berserker” combatants descend into a “beastlike, godlike, socially disconnected...*enraged*, reckless” state, in which they are

speculated to be at higher risk of committing transgressive acts (Shay, 1994, p. 82). In support of this speculation, among Vietnam veterans, witnessing the death of a close comrade was significantly associated with killing others and indirectly related to committing atrocities (through its positive association with killing others) (Fontana & Rosenheck, 1999). Among OIF/OEF Soldiers and Marines, those with heavy combat exposure *and* who had casualties in their unit *or* handled dead bodies were more likely to report unethical behavior towards civilians (Army, 2006). Clinical accounts of moral injury also suggest that losses within combat units may engender strong moral emotions such as contempt that increase the likelihood of committing transgressive acts (Farnsworth et al., 2014).

Precombat personality variables were suggested as risk factors for transgressive acts by Litz et al. (2009). So far, anger/aggressiveness has been examined as a potential personality risk factor for transgressive acts. Among Vietnam Army and Marine veterans, aggression was moderately correlated with atrocity involvement (Holowka et al., 2012). Additionally, in this sample the relation between aggression and atrocity involvement was fully mediated by combat exposure. Among three studies of OIF/OEF military personnel, anger and aggressiveness were consistently associated with transgressive acts (Army, 2006; Killgore et al., 2008; Maguen et al., 2010); however, anger/aggressiveness was conceptualized as an outcome rather than a predictor of transgressive acts in these studies. Additionally, in a qualitative study, 13% of OIF/OEF veterans ($N = 24$) attributed their postdeployment anger to transgressive acts (e.g., betrayal by commanding officer; Worthen & Ahern, 2013). Interpretation of these findings is difficult because the above

studies were cross-sectional, and it is unclear whether dispositional anger leads to increased risk of transgressive acts, or if transgressive acts leads to anger and aggressiveness, or both (Farnsworth et al., 2014).

Moral Injury Model

A frequently cited model of moral injury (Litz et al., 2009) described the moral injury syndrome as consisting of the PTSD symptoms of intrusive memories, emotional numbing, and avoidance along with collateral effects of self-injury, demoralization, and self-handicapping. Self-injurious behaviors include substance abuse, risk-taking, and suicidality. Demoralization is an affective and cognitive phenomenon that manifests as despair, worthlessness, and meaninglessness. Self-handicapping involves shunning positive experiences, such as success or positive emotions. Additionally, Litz and colleagues' (2009) moral injury model proposed a number of mechanisms of moral injury development following transgressive acts, particularly guilt and shame.

Transgressive acts and PTSD. A growing body of empirical evidence points to the relations between transgressive acts and PTSD symptoms. For example, a number of studies have found a significant relation between killing in combat (a signal transgressive act) and PTSD after controlling for combat exposure in samples of Vietnam, Gulf War, and Iraq War veterans (e.g., Fontana & Rosenheck, 1999; Hiley-Young et al., 1995; Maguen et al., 2009, 2010, 2011b). Committing atrocities was also associated with more severe PTSD in Vietnam veterans (Beckham, Feldman, & Kirby, 1998; Hiley-Young et al., 1995; Maguen et al., 2009). Being directly responsible for the deaths of enemy combatants, Vietnamese citizens, or Vietnamese prisoners of war, or being involved in

situations wherein women, elderly people, and children were killed, were all associated with significantly more severe PTSD symptoms (Maguen et al., 2009).

Transgressive acts and collateral effects. Data on the collateral effects of moral injury (self-injury, demoralization, self-handicapping) are mixed, and the availability of data varies greatly across collateral effects. A thorough literature review on moral injury collateral effects is included in Appendix A (see also Frankfurt & Frazier, 2015); a brief review is presented here.

The associations between transgressive acts and self-injury have received the most attention. Overall, available data suggest that transgressive acts have a small but significant association with increased suicidality—a potentially lethal and highly risky form of self-injury (Bryan, Bryan, Morrow, Etienne, & Ray-Sannerud, 2014; Currier et al., 2014; Maguen et al., 2011a, 2012). Among Vietnam veterans, committing atrocities was significantly correlated with suicide intent and attempts, with small effects (Currier et al., 2014). One study suggested that being in a berserker state (e.g., out of control due to grief and anger) while committing a transgressive act was associated with greater suicidality, a moral injury outcome (Hendin & Hass, 1991): Veterans who committed a transgressive act were much more likely to be suicidal if they reported being in a berserker state during the transgressive act than if they did not report being in a berserker state during the transgressive act.

Transgressive acts (e.g., killing in combat, committing atrocities) were associated with greater risk of postdeployment substance abuse, another form of self-injury, among OIF (Killgore et al., 2008; Wilk et al., 2010) and Vietnam veterans (Currier et al., 2014;

Yager et al., 1984). However, the direction of the association is not known because veterans with substance abuse problems may be more likely to commit transgressive acts. “Severe recklessness” (Litz et al., 2009; p. 701) was identified as a form of moral injury-related self-injury; however, the one study that examined the relations between transgressive acts and postdeployment risk-taking found a small effect that did not differ from the relation between violent nontransgressive combat and post-deployment risk taking (Killgore et al., 2008). Thus, postdeployment risk taking may not be uniquely related to transgressive acts and could have motivations besides self-injury.

No studies have examined the relations between transgressive acts and demoralization or self-handicapping. However, clinical literature has identified posttraumatic demoralization as a common expression of suffering for veterans (Parson, 1990). One study that examined hopelessness, a facet of demoralization, found that OIF/OEF veterans with combat experience and PTSD reported significantly more hopelessness than those without combat exposure (Jakupcak et al., 2011).

Mechanisms of moral injury. According to the moral injury model, engaging in transgressive acts is associated with guilt and shame, which are in turn associated with greater risk of PTSD and the other collateral effects of moral injury. Two studies have examined whether veterans with transgressive acts experience more guilt and shame. Combat-related guilt and shame were moderately correlated with committing atrocities and with suicidality (Fontana, Rosenheck, & Brett, 1992). Another study found that wartime participation in atrocities was associated with guilt, and guilt was associated with PTSD (Currier et al., 2014). Wartime participation in atrocities was also associated

directly and indirectly (through PTSD symptoms) with suicidality (Currier et al., 2014). However, combat-related guilt did not mediate the relation between participation in atrocities and suicidality. Additionally, guilt and shame have been associated with more severe PTSD among other combat-exposed samples (Beckham, Feldman, & Kirby, 1998; Fontana, Rosenheck, & Brett, 1992; Leskela, Dieperink, & Thuras, 2002).

Summary

Overall, the current body of literature on moral injury is limited by the dearth of empirical and clinical data. Little data are available on the prevalence of a wide range of transgressive acts, and no studies have systematically assessed a wide range of transgressive acts in combat-exposed veterans. Potential risk factors for transgressive acts have not been systematically assessed, nor have the relations among these risk factors been examined. No studies have examined the association between witnessing the death of a comrade and transgressive acts, or the association of witnessing the death of a comrade and moral injury outcomes (e.g., demoralization, suicidality, PTSD). Few studies have examined the relations between anger/aggressiveness and transgressive acts, and no studies have examined anger/aggressiveness in conjunction with other potential risk factors of moral injury.

Little data are available on moral injury outcomes (e.g., PTSD, suicide, demoralization) following transgressive acts. No studies have examined whether transgressive acts are associated with more demoralization. Few studies have assessed combat-related guilt, a mechanism of moral injury, in relation to transgressive acts. Few studies have examined multiple components of the moral injury model at one time; that

is, examined the relations among transgressive acts, moral injury outcomes (e.g., PTSD), proposed mechanisms (e.g., guilt), and risk factors (e.g., aggressiveness), or have employed mediation analyses that empirically test these relations.

Present Study

The current study sought to test key tenets of the moral injury model—the association of risk factors for transgressive acts (i.e., combat exposure, witnessing comrade’s death, aggression) and transgressive act exposure; the relations between transgressive acts and moral injury outcomes (i.e., PTSD, demoralization, suicidality), and the effect of transgressive acts on moral injury through guilt. These relations were tested using structural equation modeling (SEM) using data collected from U.S. veterans who completed Compensation and Pension (C&P) exams at a Midwestern VA. Because this study used secondary data analysis, not all aspects of the moral injury model (e.g., self-handicapping) were available to be tested.

Three models of moral injury were tested using SEM. Model 1 tested the direct and indirect effects proposed by Litz and colleagues’ model of moral injury (see Figure 1). This model specified that transgressive acts would directly predict suicidality (path a), demoralization (path b), PTSD (path c), and guilt (path d). It was also modeled that guilt would directly predict suicidality (path e), demoralization (path f), and PTSD (path g). The indirect paths from transgressive acts (through guilt) to suicidality, demoralization, and PTSD were expected to be significant.

Model 2 included risk factors for transgressive acts that were identified by previous writers (Fontana & Rosenheck, 1999; Holowka et al., 2012; Shay, 1994) (see

Figure 2). The inclusion of risk factors for transgressive acts increases the amount of variance explained in the outcomes and also accounts for the relation between combat exposure and moral injury. In this model, aggression (path a), witnessing a comrade's death (path b), and combat exposure (path c) were correlated with transgressive acts; transgressive acts were modeled to directly predict moral injury outcomes—suicidality (path d), demoralization (path e), and PTSD (path f), and predict a mechanism of moral injury—guilt (path g). It was also modeled that guilt would predict suicidality (path h), demoralization (path i), and PTSD (path j). To better understand the relations between combat exposure and moral injury mechanism and outcomes, it was modeled that combat exposure would directly predict suicidality (path k), demoralization (path l), PTSD (path m), and guilt (path n). Combat exposure was correlated with the two other risk factors for transgressive acts—aggression (path o) and witnessing a comrade's death (path p)—because prior literature supports the relation between combat exposure and aggression (Holowka et al., 2012) and common sense suggests an association between witnessing a comrade's death and combat exposure. The indirect paths of transgressive acts and combat exposure (both through guilt) to suicidality, demoralization, and PTSD were hypothesized to be significant.

Model 3 was an alternative configuration of Model 2, and in this model demoralization was a mechanism of moral injury, rather than a collateral outcome (see Figure 3). Model 3 was tested because a facet of demoralization—hopelessness—was identified as a potential risk factor for suicidality among some veterans (Jakupcak et al., 2011). As in Model 2, aggression (path a), witnessing a comrade's death (path b), and

combat exposure (path c) were correlated with transgressive acts; transgressive acts directly predicted suicidality (path d), PTSD (path e), demoralization (path f), and guilt (path g), and guilt directly predicted suicidality (path h) and PTSD (path i).

Demoralization directly predicted suicidality (path j) and PTSD (path k). To better understand the relations between combat exposure and moral injury, it was modeled that combat exposure would directly predict suicidality (path l), PTSD (path m), guilt (path n), and demoralization (path o). It was also modeled that combat exposure was correlated with aggression (path p) and witnessing a comrade's death (path q). The indirect paths from transgressive acts and combat exposure through guilt and demoralization to suicidality and PTSD were assessed.

This study contributes novel information to the literature on moral injury. This is the first study to assess a wide range of transgressive acts beyond killing and committing atrocities. Few studies have assessed multiple risk factors of transgressive acts or examined the associations of these risk factors with moral injury outcomes. Additionally, little research has looked at the unique effect of transgressive acts apart from combat exposure on moral injury. This is the second study to empirically examine the impact of witnessing a comrade's death on transgressive acts, guilt, and moral injury outcomes. The current research contributes to the literature on the combined associations between transgressive acts, combat-related guilt, and moral injury outcomes. No other study has investigated demoralization in the context of transgressive acts. Finally, the current study provides one of the first tests of multiple components of the moral injury model, and one of first mediation models of moral injury.

Method

Procedure and Sample

Veterans who had at least one encounter with the Minneapolis Veteran's Affairs Medical Center (VAMC) were recruited by the Brain Sciences Center at the Minneapolis VAMC for participation in a larger study on the brain bases of mental disorders ($N = 616$) (see Georgopolous et al., 2007, for more information). Participants were included in this secondary data analysis if they completed an Minnesota Multiphasic Personality Inventory – Second edition (MMPI-2) and Mississippi Scale for Combat-Related PTSD (M-PTSD) as part of a Compensation and Pension (C&P) exam at the Minneapolis VAMC ($N = 261$). Participants were excluded from the current study if they were female ($n = 55$) because the majority of women were not combat exposed and experienced a military sexual trauma as their signal trauma. Although military sexual trauma may be a transgressive act vis-à-vis betrayal by a commanding authority, I speculated that moral injury outcomes associated with military sexual trauma may differ from those associated with combat. Additionally, participants were excluded if they produced an MMPI-2 deemed invalid by a trained licensed psychologist ($n = 16$). Thus, a total of 190 male veterans with interpretable MMPI-2s qualified for inclusion in this study. The SEM analyses were adequately powered to detect a small effect (Soper, 2015). The majority (91%) of this sample was white, 2% was Native American, and less than 2% each was African American, Asian, or Latino; 5% of the sample did not report their race/ethnicity. The mean age of the sample was 55 years old ($SD = 15.30$). A majority of the participants served in the Vietnam Era (58%) or Operation Iraqi Freedom/Operation Enduring

Freedom era (31%). The current subsample did not significantly differ from the larger sample in terms of average age, $t(606) = -1.45, p = .15$. The distribution of race categories differed across the larger sample and the subsample, $\chi^2(5, N = 608) = 11.56, p < .05$. The larger sample had a larger proportion of African American veterans (5%) than did the subsample (1%). The larger sample also differed from the subsample in terms of war era, $\chi^2(8, N = 608) = 26.86, p < .05$. Specifically, the larger subsample had a smaller proportion of veterans who served in the Korean War (.5% vs. 2%), a smaller proportion of Vietnam veterans (48% vs. 58%), and a larger proportion of veterans who served in peacetime/post-Korea (8% vs. 1%).

The study protocols were approved by the institutional review boards at the Minneapolis VAMC and the University of Minnesota, and participants provided written informed consent before the parent study. Participants were compensated for their time. See Appendix B for additional information about sample selection and data preparation.

Measures

Demographic variables. Data on age, race, and theater of combat (e.g., WWII, Vietnam War) were gathered from parent study surveys.

Transgressive acts. Two methods were used to assess whether participants had engaged in transgressive acts. First, trauma narratives from Compensation and Pension (C & P) Examinations were coded for transgressive act exposure. C&P examinations are extensive diagnostic interviews used to determine eligibility for benefits for service-related medical and psychological conditions. For this study, only C&P examinations that evaluated PTSD were used; these examinations were conducted by trained licensed

psychologists. Most commonly, these C&P exams were conducted using the Clinician-Administered PTSD Scale – IV (CAPS-IV; Blake et al., 1995), a structured diagnostic interview that assessed each criterion and symptom of PTSD in the DSM-IV. These interviews were conducted between 2002 and 2012, except for one done in 1984. Each interview took approximately 60 to 90 minutes. In the PTSD diagnostic assessment, veterans recollected up to three events that potentially met Criterion A (i.e., trauma criterion) in the DSM-III and DSM-IV PTSD diagnostic criteria.

Ten potentially transgressive acts (i.e., witnessing/learning about suicide of comrade, witnessing/failing to prevent injuries/harm to noncombatant, killing enemy combatant, injuring/killing noncombatant/women and children, committing a massacre of civilians, learning about/failing to prevent/witnessing atrocities/massacre, friendly fire [weapon fire or attack from friendly forces on friendly forces, most often resulting in injuries or death], committing/ witnessing/learning about fragging [assassination or attempted assassination of one military personnel by another military personnel], witnessing/handling dead bodies, vague statement of commission) were coded. These events were derived from prior empirical and clinical literature on the antecedents of moral injury (e.g., Drescher et al., 2011; Litz et al., 2009; Shay, 1995).

For the purposes of this study, a team of trained trauma experts coded the type of trauma or transgressive act described in the narratives. The coders were three Ph.D.-level licensed psychologists and one M.A.-level social work intern who worked at the Brain Sciences Center and had expertise in combat-related trauma and diagnostic interviewing (see Appendix B for coding procedure).

The coding team went through two rounds of training before coding the trauma narratives. During the first training period, each coder coded 15 narratives and during the second training period, they each coded 20 narratives. Fleiss' *kappa*, an index of interrater agreement used with more than two raters, was estimated using an online calculator (Geertzen, 2012). The interrater agreement for the transgressive acts coded during the second training period ranged from .71 (friendly fire) to 1.0 (killing enemy combatant). One transgressive act (fragging) had a much lower Fleiss' *kappa* ($kappa = .31$), but was included because the low count of these events in the training session likely deflated interrater agreement. The average Fleiss' *kappa* was .72. Two categories of transgressive acts demonstrated very poor interrater agreement (vague statements of commission, harm to a noncombatant), with Fleiss' *kappa* ranging from -.04 to -.02. These categories were dropped from subsequent analyses. For the final ratings, each coder coded approximately 76 narratives; following the training, each narrative was coded by one rater.

Second, one item from the Deployment Risk and Resilience Inventory (DRRI; King et al., 2003) was used to assess transgressive act exposure: "I killed or think I killed someone in combat." The DRRI is a list of 107 life events that may occur during childhood, deployment, or postdeployment. The "killing" question on the DRRI has been used to examine the relations between transgressive acts and negative mental health outcomes (e.g., PTSD) in previous studies (e.g., Maguen et al., 2013). In the current study, only two veterans (1%) who reported killing an enemy combatant in the C&P examination did *not* also answer "yes" to the DRRI "killing" question.

A “yes or no” variable indexing a history of any transgressive act exposure was then created by combining the coded C&P exams and the “killing” question on the DRRI. If veterans described any transgressive acts on the C&P exam or “killing” on the DRRI, they were coded as positive for transgressive act history. If veterans responded “no” on the killing question on the DRRI and did not report any on their C&P exam, they were coded as negative.

Transgressive act risk factors. First, the aggression subscale of the Personality Psychopathology Scales-5 (PSY-5; Harkness, McNulty, & Ben-Porath, 1995) was used. The 18-item aggression scale (AGG) measures dispositional differences in offensive aggression, grandiosity, and desire for power. In a previous study of transgressive acts and PSY-5 personality traits among U.S. veterans, Cronbach’s α was .65 (Holowka et al., 2012). In a study of combat-related PTSD and personality subtypes, internal consistency was Cronbach’s $\alpha = .65$ (Miller, Kaloupek, Dillon, & Keane, 2004). Because only scale scores for the PSY-5 were available, Cronbach’s alpha could not be calculated for the current sample.

Second, one question from the DRRI assessed exposure to loss of a close comrade, a proposed risk factor for transgressive acts: “I personally witnessed someone from my unit or and [sic] ally unit being seriously wounded or killed.” This item was answered using a “yes or no” scale.

Third, the 15-item combat exposure subscale of the DRRI (King et al., 2003) was used to assess combat exposure during deployment. The questions on killing and witnessing a comrade’s death were removed from this scale, which left 13 items on the

combat exposure scale for the current study. Sample items included, “I was part of an assault on an entrenched or fortified position;” and “I was wounded or injured in combat.” Items were answered using a “yes or no” scale. In a validation study of the DRRI using two different samples of OIF and first Gulf War soldiers, internal consistency of the full-length combat exposure scale was Cronbach’s $\alpha = .85$ and combat personnel had significantly higher scores on the combat exposure scale than support personnel, Cohen’s $d = 1.05$ (Vogt, Proctor, King, King, & Vasterling, 2008). Cronbach’s α was .84 in this sample for the 13-item version of the DRRI combat exposure scale.

Moral injury mechanism (guilt). Combat-related guilt was assessed using one question on the 35-item Mississippi Scale for Combat-Related PTSD (M-PTSD; Keane, Caddell, & Taylor, 1988). This M-PTSD item was rated on a 0 (*not at all/never*) to 5 (*very true*) scale. The item used was “I do not feel guilt over things I did in the military.” This item was reverse coded for the purpose of analyses.

Moral injury outcomes. PTSD symptom clusters were assessed using the Posttraumatic Stress Disorder Checklist-Civilian version (PCL-C; Weathers et al., 1991). The PCL-C is a 17-item checklist that assesses the presence and severity of each PTSD symptom in the DSM-IV PTSD diagnostic criteria. Items were rated on a 5-point scale, ranging from “*not at all*” (1) to “*extremely*” (5). Total score could range from 17 – 85 and captured the global severity of PTSD symptoms. A previous study found adequate internal consistency in a military sample (Vogt et al., 2008). In the current study, Cronbach’s α was .94.

Suicidality was assessed using one item on the 35-item M-PTSD (Keane, Caddell, & Taylor, 1988). This item was rated on a 0 (*not at all/never*) to 5 (*very true*) scale. The item used was, “Lately, I have felt like killing myself.”

Demoralization was assessed using the 24-item “demoralization” restructured clinical scale on the MMPI-2 (Rcd; Butcher, Dahlstrom, Graham, & Tellegen, 1989). The MMPI-2 is considered the gold standard in personality measurement and is the most widely used measure of psychopathology. Scores on the 24-item demoralization subscale had a Cronbach’s alpha of .93 in an outpatient treatment-seeking sample (Sellbom, Graham, & Schenk, 2006). Cronbach’s alpha could not be calculated in the current sample because only scale scores, and not individual items, were available.

Data Analysis Plan

First, I identified participants with and without a history of transgressive acts based on the DRRRI and combined DRRRI and C&P variables. Second, I examined the bivariate correlations between transgressive acts, risk factors for transgressive acts, guilt, and moral injury outcomes.

Third, structural equation modeling (SEM) was used to test the direct and indirect relations between transgressive acts, risk factors for transgressive acts (aggression, witnessing a close comrade’s death, combat exposure), a mechanism of moral injury (guilt), and moral injury outcomes (PTSD, suicidality, demoralization). Three different models were run and compared. Model 1 tested portions of Litz and colleagues’ (2009) conceptualization of moral injury (see Figure 1). Model 2 tested a model of moral injury that included relevant risk factors of transgressive acts (see Figure 2). Model 3 tested an

alternative configuration of moral injury wherein demoralization was a mechanism of moral injury rather than an outcome.

In the SEM, aggression, witnessing death of a comrade, and combat exposure were measured as independent manifest variables. Guilt was measured as a manifest mediating variable. Suicide, and demoralization were measured as dependent manifest variables. PTSD was measured as a latent dependent variable with three indicators (re-experiencing PTSD symptoms, avoidance and numbing PTSD symptoms, and hyperarousal PTSD symptoms).

I examined a number of different indicators of model fit to determine the best model. Fit indices were: χ^2 test of model fit, comparative fit indices (CFI; Bentler, 1990), Tucker-Lewis index (TLI; Tucker & Lewis, 1973), standardized root mean square residual (SRMR; Hu & Bentler, 1999), and the root mean square error of approximation (RMSEA; Chen, Curran, Bollen, Kirby, & Paxton, 2008). CFI and TLI values $>.90$ are generally considered signs of adequate fit (Hu & Bentler, 1999). SRMR and RMSEA values of $\leq .05$ are commonly considered a sign of good fit when examined in conjunction with other fit indices (Chen et al., 2008; Hu & Bentler, 1999).

Descriptive analyses and correlations were conducted using SPSS v.19 for Windows. SEM was conducted using Mplus, Version 7.3 (Muthen & Muthen, 2014).

Results

Descriptive Statistics

Prior to running analyses, the data were examined for missingness, outliers, and normality. Data were missing on $<5\%$ of the variables except for the two DRRI variables:

14% of participants did not respond to the “killing in combat” question and 9% did not respond to the “witnessing ally being injured/killed” question. The presence of outliers was investigated using boxplots. Seven outliers on the suicidality measure were considered interpretable; these scores were either a 4 or a 5 on the measure, suggesting severe suicidality. An outlier on the MMPI-2 aggression measure was left in the dataset because the score were deemed interpretable by a licensed psychologist. No other outliers were identified.

The normality of the variables was assessed by dividing the skewness and kurtosis of each variable by its standard error of estimate; values ± 1.96 were considered significantly skewed or kurtotic. One variable—suicidality—was both positively skewed (skewness = 2.2, *S.E.* = .18) and leptokurtotic (kurtosis = 4.17, *S.E.* = .36). Two variables were skewed but not kurtotic: aggression (skewness = .69, *S.E.* = .18) and the hypervigilance PTSD symptoms (-.364, *S.E.* = .181). Two variables demonstrated significant kurtosis: guilt (kurtosis = -3.22, *S.E.* = .355) and demoralization (kurtosis = -.967, *S.E.* = .352).¹ To account for the nonnormality of the variables, structural equation models were run using maximum likelihood estimation with robust standard errors.

Transgressive Acts and Moral Injury Predictors, Outcomes, and Mechanisms

In the current sample, 56% of veterans ($n = 106$) reported killing an enemy combatant on the DRRI. Using the C&P data, 54% of the sample ($n = 102$) reported a transgressive act. The most common transgressive acts that were identified in the C&P

¹ The nonnormality of these variables (except suicidality) did not appear extreme using visual inspection and also appeared clinically appropriate. To deal with nonnormality, the data were transformed by lg10 and ln transformations, which did not ameliorate the nonnormality nor change the results. Untransformed data were analyzed in all subsequent analyses.

evaluations were handling dead bodies (39%; $n = 74$) and killing an enemy combatant (17%; $n = 32$). One narrative coded as involving “handling dead bodies” was, “[The participant] was drafted for mortuary duty as well as body part detail. He noted that as a result for a 1-2 week period during that time he would go through chests with body parts, wash down bodies, help with the embalming, and put bodies into coffins...he noted that there were also times where he would take out a head out of another body part and it would be horrifying.” An example of a “killing enemy combatant” narrative was, “[The participant] was particularly horrified after he shot one of the enemy soldiers until [sic] he dragged him out of the hole and pulled out his wallet and saw a picture of three little girls.” Injuring or killing a noncombatant and incidents of friendly fire were both reported by 5% of participants ($n = 9$). An example of “injuring/killing noncombatant/women and children” was “[The participant] described one incident in which a 9-year old boy was killed...The mother approached them, carrying her dead 9-year-old son who had been killed by a mortar. The woman was given \$300.00 and she left the body of her son with them. [The participant] said he was in awe, that the mother would accept the money and leave her son’s body...He stated he felt extremely frightened all of the time, but did not indicate he felt particularly fearful during this incident. He reported feeling ashamed and helpless, saying there was a sense that one had no control over what happens.” An example of “friendly fire” was: “[The participant] indicated that while on [an Air Force operation in the Vietnam War], one of the U.S. helicopters was shot down. He was ordered by his pilot to drop a smoke bomb in order to mark the spot at which the U.S. helicopter had to ditch. He stated that apparently there

was a miscommunication and a pilot in the Cobra helicopter mistaken [sic] the smoke as an indication of enemy activity and fired upon the site. [The participant] indicated that he felt very distressed over the fact that he contributed to the grounded aircrew being killed by the Cobra helicopter.” Six participants (3%) reported witnessing or failing to prevent a massacre of civilians, five participants (3%) reported witnessing the suicide of a comrade as their signal trauma, and one veteran reported an incident of fragging.

In total, 75% ($n = 142$) of the sample reported any type of transgressive act, based on the combined DRRI and C&P exam data. On the DRRI, 70% of veterans ($n = 133$) reported witnessing a close ally being seriously injured or killed. The average total PTSD severity in the sample was above the clinical cut-off for PTSD in a VA mental health setting (range = 45-50; VA National Center for PTSD, 2014). MMPI-2 scores have a clinical cut-off of $T \geq 65$: the mean aggression score was below the clinical cut-off and mean demoralization score was at the clinical cut-off. Mean guilt and suicidality scores on the M-PTSD fell in the “never” to “rarely” range. Please see Table 1 for complete descriptive data.

Pearson product-moment correlations explored the relations between history of transgressive acts and risk factors for transgressive acts (aggression, witnessing a close comrade’s death, combat exposure), a mechanism of moral injury (guilt), and moral injury outcomes (PTSD symptom clusters and total symptom severity, demoralization, suicidality). All three risk factors were significantly correlated with transgressive acts. Guilt, a mechanism of moral injury, was significantly correlated with transgressive acts. Re-experiencing PTSD symptoms and total PTSD severity, moral injury outcomes, were

also significantly correlated with transgressive acts. The strength of these relations ranged from small (with PTSD) to large (with combat exposure). However, some moral injury outcomes - demoralization, avoidance and numbing PTSD symptoms, hypervigilance PTSD symptoms, and suicidality - were not significantly correlated with transgressive acts. Please see Table 2 for the full correlation matrix of study variables.²

I also looked at the correlations between killing in combat, a signal transgressive act that has been studied in previous research (e.g., Maguen et al., 2009), and these risk factors, mechanism, and outcomes. The purpose of these analyses was to compare the strength of correlations between the killing variable and the transgressive act variable and the other variables assessed to ensure that the newly created transgressive act variable did not “water down” the relations between transgressive acts and the other variables. The pattern and strength of correlations of moral injury variables with the killing in combat variable were generally the same as with transgressive acts (see Table 2). Killing in combat was significantly correlated with hypervigilance PTSD symptoms. Additionally, killing in combat was strongly correlated with transgressive acts. This provides converging evidence that the measure of transgressive acts that was created for this study was functioning adequately.

The prevalence of transgressive acts and the correlations between transgressive acts and moral injury variables were compared between Vietnam veterans (n = 110 and

² I also compared the pattern of correlations between transgressive acts identified using only the C&P data and transgressive acts identified only by the DRRI “killing” variable with the moral injury variables. The pattern of correlations did not differ depending on the measure of transgressive act that was used. I also looked at the correlation between total combat exposure (including killing and witnessing a comrade’s death) and PTSD; this correlation was not significant.

OIF/OEF ($n = 59$) veterans. These eras were compared because the Vietnam cohort constituted a drafted Army, whereas the OIF/OEF cohort was an all-volunteer force. The prevalence of transgressive acts differed significantly between these two eras, $\chi^2(1, N = 190) = 4.58, p < .05$; specifically, 81% of Vietnam veterans reported transgressive acts, and 61% of OIF/OEF veterans reported transgressive acts. The rate of killing in combat also differed between the two eras, $\chi^2(1, N = 190) = 5.72, p < .05$; 71% of Vietnam veterans reported killing in combat compared to 51% of OIF/OEF veterans. Additionally, the correlations between transgressive acts and guilt and moral injury outcomes differed between eras. Among Vietnam veterans, transgressive acts were not correlated with the moral injury mechanism (guilt), or outcomes (PTSD, demoralization, suicidality), r 's = .00 - .10, $p > .05$. Among OIF/OEF veterans, transgressive acts were correlated with guilt, $r = .30, p < .05$, aggression, $r = .37, p < .05$, PTSD total severity, $r = .35, p < .05$, and re-experiencing and hyperarousal PTSD symptom clusters, r 's = .41 and .30, $p < .05$; however, transgressive acts were not correlated with demoralization, $r = .17, p = .21$. The other eras could not be compared due to low count of participants.

Structural Equation Modeling Testing Mediation Models

Structural equation modeling was used to assess three different models of moral injury. Model 1 represented a model testing portions of Litz and colleagues' (2009) moral injury model: transgressive acts result in guilt that in turn results in the moral injury outcomes of PTSD, demoralization, and suicidality (see Figure 1). This model tested the direct and indirect relations between transgressive acts, guilt, and suicidality, PTSD, and demoralization. Overall, this model provided adequate fit to the data, $\chi^2(8) = 25.71, p <$

.01; CFI = .96; TLI = .91; SRMR = .03; RMSEA = .11, CI = .06 - .16. In this model, the direct relation between transgressive acts and guilt (path d) was significant. The direct relations between guilt and suicidality (path e), demoralization (path f), and PTSD (path g) were all significant. Transgressive acts did *not* have a direct effect on suicidality (path a), demoralization (path b), or PTSD (path c). The indirect effects of transgressive acts through guilt to suicidality were significant, $\beta = .16$, $S.E. = .07$, $p < .01$, as was the indirect effect through guilt to demoralization, $\beta = .15$, $S.E. = .07$, $p < .01$. However, the indirect relation through guilt to PTSD was not significant, $\beta = .08$, $S.E. = .05$, $p = .11$. See Figure 4 for standardized coefficients.

Model 2 included three risk factors for transgressive acts (aggression, witnessing comrade's death, combat exposure) and the relations between combat exposure and guilt and moral injury outcomes (see Figure 2). Overall, this model provided adequate fit to the data, $\chi^2(23) = 48.40$, $p < .001$; CFI = .96; TLI = .92; SRMR = .05; RMSEA = .08, CI = .05 - .10. In this model, the following paths were significant. The correlations between aggression (path a), witnessing a comrade's death (path b), and combat exposure (path c) and transgressive acts were all significant. Transgressive acts directly predicted PTSD (path f), but did *not* have a significant direct effect on suicidality (path d), or demoralization (path c). Transgressive acts had a significant direct effect on guilt (path g) and guilt directly predicted suicide (path h), demoralization (path i), and PTSD (path j). Although combat exposure did not have a direct effect on suicide (path k), PTSD (path m), or guilt (path n), it did have a direct *negative* effect on demoralization (path k). Additionally, combat exposure was correlated with aggression (path o) and witnessing a

comrade's death (path p). The indirect effects of transgressive acts through guilt to suicide, $\beta = .09$, $S.E. = .04$, $p < .05$, and to demoralization, $\beta = .08$, $S.E. = .03$, $p < .05$, were significant. As in Model 1, the indirect relation through guilt to PTSD was not significant, $\beta = .06$, $S.E. = .03$, $p > .05$. The indirect effects of combat exposure through guilt to moral injury outcomes (e.g., suicide, $\beta = -.03$, $S.E. = .03$, $p = .11$; demoralization, $\beta = -.03$, $S.E. = .03$, $p = .40$; PTSD, $\beta = -.01$, $S.E. = .02$, $p = .42$) were not significant. This model, with the added risk factors, explained significant variance in suicide, $r^2 = .12$, $p < .01$, and demoralization, $r^2 = .12$, $p < .05$, although not PTSD, $r^2 = .06$, $p > .05$. See Figure 5 for standardized coefficients.

Model 3 represented an alternative configuration of the moral injury model, wherein demoralization was treated as a mechanism rather than an outcome of moral injury (see Figure 3). For clarity of reporting, the effects that are equivalent from Model 2 are not reported here again. In this model, transgressive acts had a significant direct effect on demoralization (path g) and PTSD (path e), and demoralization had a significant direct effect on both suicidality (path j) and PTSD (path k). The indirect effect of transgressive acts through guilt to suicide was significant $\beta = .06$, $S.E. = .03$, $p < .05$, although the indirect effect to PTSD was not significant, $\beta = .00$, $S.E. = .02$, $p = .86$. The indirect effects of transgressive acts through demoralization to suicidality, $\beta = .06$, $S.E. = .03$, $p = .06$, and to PTSD, $\beta = .08$, $S.E. = .04$, $p = .06$, both approached significance. Additionally there were indirect effects from combat exposure through demoralization to suicidality, $\beta = -.08$, $S.E. = .03$, $p < .05$, and through demoralization to PTSD, $\beta = -.10$, $S.E. = .04$, $p < .05$. Model 3, with the added risk factors and demoralization as a mechanism of moral

injury, explained significant variance in suicide, $r^2 = .25, p < .01$ and PTSD, $r^2 = .26, p < .05$. See Figure 6 for standardized coefficients.

Discussion

The current study was the first to test key assertions of a frequently-cited model of moral injury (Litz et al., 2009) and the first to integrate other writers' works on moral injury (Fontana & Rosenheck, 1999; Holowka et al., 2012; Shay, 1994) into this model. This study tested multiple components of the moral injury model—transgressive acts, risk factors for transgressive acts, moral injury outcomes (suicide, demoralization, PTSD), and a mechanism of moral injury (guilt)—at one time. The main findings from each of these domains will be discussed in turn, and then directions for future research and treatment implications will be proposed.

The current sample had a higher endorsement rate of transgressive acts (76%) than previous studies, which could be due to the greater number of transgressive acts assessed (e.g., handling dead bodies). The rate of killing among OIF/OEF veterans (51%) was similar to previous surveys (Hoge et al., 2004), although the rate among Vietnam veterans (71%) was higher than in some previous surveys (Maguen et al., 2009). The current rate of killing is relatively equivalent to previous samples of both service-seeking and non-service seeking samples, and suggests that the current sample is fairly representative of the male combat-exposed veteran population. This also suggests that combat-exposed veterans who present to a VA medical center seeking services for PTSD have a high likelihood of transgressive acts.

The most common transgressive acts reported during the C&P evaluations were handling dead bodies and killing in combat. When handling dead bodies, combatants sometimes experience extreme disturbance in their sense of social order and meaning, which can be heightened if combatants identify with the dead bodies (Ursano & McCarroll, 1990). Additionally, handling decaying bodies can involve grotesque and overwhelming tactile, visual, and olfactory sensations that are difficult to forget. That veterans are applying for PTSD-related disability benefits because of killing in combat is consistent with previous empirical research on the likelihood of developing PTSD after killing in combat (e.g., Fontana & Rosenheck, 1999).

Generally, proposed risk factors for transgressive acts—aggression, witnessing a comrade’s death, combat exposure—were significantly associated with transgressive acts. The correlation between aggression and combat exposure was somewhat stronger than the correlation between aggression and transgressive acts in particular. It may be that aggression heightens the likelihood of combat exposure, which in turn heightens combatants’ risk of transgressive acts. The association between combat exposure and transgressive acts has been found across different cohorts of veterans (Maguen et al., 2009, 2010). The nature of the association between combat exposure and transgressive acts bears further examination. It may be that opportunities for transgressive acts are increased with more combat exposure or that increased combat exposure heightens the likelihood of witnessing the death of a close comrade which in turn increases the risk of transgressive acts. Consistent with clinical suppositions (Farnsworth et al., 2014; Shay, 1994) and empirical study (Fontana & Rosenheck, 1999), witnessing a close comrade’s

death was associated with transgressive acts in bivariate correlations and in the SEM models. It may be that witnessing a close comrade's death engenders emotions such as disgust and contempt that heighten the risk of transgressive acts (Farnsworth et al., 2014). These possibilities need further examination.

Findings regarding the relations between transgressive acts and moral injury outcomes were somewhat mixed. Transgressive acts did have a significant direct effect on PTSD, which was consistent with previous research (e.g., Fontana & Rosenheck, 1998), although not on suicidality, which was contrary to previous research (e.g., Bryan et al., 2014). Transgressive acts were significantly correlated with total PTSD severity and re-experiencing PTSD symptoms as was proposed in a moral injury model (Litz et al., 2009), but were not associated with avoidance and numbing symptoms, demoralization, or suicide. It is unclear whether these findings are due to sample characteristics or are due to the functional relation between transgressive acts and different moral injury collateral effects.

Additionally, significant differences in the correlations among transgressive acts and moral injury variables were found between Vietnam and OIF/OEF era veterans. Generally, transgressive acts were not associated with moral injury variables among Vietnam veterans. However, transgressive acts were moderately correlated with moral injury variables among OIF/OEF veterans. This is contrary to my expectation that an all-volunteer force would be less disturbed by their combat experiences than a drafted force. In this sample, it may be that a majority of the Vietnam veterans were doing relatively fine, and a small number of Vietnam veterans suffered greatly over the past decades,

which would be consistent with previous findings that a minority of Vietnam veterans experience chronic PTSD (Kulka et al., 1990). OIF/OEF veterans, on the other hand, had more recent combat and exposure to transgressive acts. Thus, those OIF/OEF veterans who would be expected to recover over time have not been able to do so yet. The significant differences between cohorts may also explain why expected relations between transgressive acts and moral injury outcomes were not, on average, identified. Significant effects among OIF/OEF veterans could have been obscured by non-significant effects among the relatively larger proportion of Vietnam veterans.

A proposed mechanism of moral injury, guilt, generally demonstrated the predicted associations with transgressive acts and moral injury outcomes. Consistent with the moral injury model (Litz et al., 2009), guilt mediated the relation between transgressive acts and moral injury outcomes—suicide, demoralization, and PTSD. The moderate association between guilt and demoralization can be clinically interpreted. Combat-related guilt has no easy outlets for reparation or amends-making, as few veterans of foreign wars are able to return to the former theater of combat to seek forgiveness from civilians that were harmed (Opp & Samson, 1989). Thus, the associations between combat-related guilt, despair, and hopelessness would be expected.

Model 3, a reconfiguration of Model 2, in which demoralization was a “mechanism” of moral injury, also fit the data. Consistent with previous literature (Bryan et al., 2013), demoralization predicted suicide with a moderate effect. Demoralization may fuel other moral injury outcomes, such as postdeployment violence and aggression that were not included in this model (Parson, 1990). For instance, a clinician suggested

that: “the human being cannot live in a condition of emptiness for very long... [this will] turn into morbidity and despair, and eventually into destructive activities” (May, 1953, quoted in Parson, 1999, p.21). Further study of phenomena associated with demoralization could help identify additional collateral effects that are relevant to the moral injury syndrome. Future studies ought to continue to examine additional moral injury collateral effects that are associated with demoralization so that the moral injury clinical syndrome is comprehensively identified. The potential multidimensionality of moral injury ought to be considered. For example, some veterans could exhibit externalized self-injurious behaviors, such as violence and extreme recklessness, while others exhibit internalized self-injurious behaviors, such as self-harm. If different expressions of moral injury are identified, interventions could be tailored to meet veterans’ needs.

Some findings in the current study were rather unexpected and bear further investigation. For instance, combat exposure had a weak and nonsignificant negative association with PTSD severity, and did not have a direct effect on PTSD in SEM models; however, witnessing a comrade’s death was correlated with PTSD. It appears that, in this sample, witnessing a comrade’s death was a more potent predictor of PTSD than these typical predictors. Although previous studies have not examined the relation between combat exposure and demoralization, the finding that these were negatively associated was unexpected. Unlike previous studies (e.g., Maguen et al., 2012), no direct association between transgressive acts and suicidality was found. Although the rate of suicidality in the current sample was approximately equivalent to that sample (about 3%),

a strong floor effect was present as all but five participants reported no suicidality.

Additional study is needed to clarify whether these findings are due to sample characteristics or are pointing to an unexpected and more complex relationship between combat exposure, transgressive acts, and moral injury outcomes.

A number of limitations of the current study were identified. First, relying on self-report to identify transgressive acts likely resulted in underreporting of some transgressive acts (e.g., atrocities) for fear of negative consequences. Second, due to the use of secondary data analysis, I was unable to test a complete range of potential moral injury outcomes. Third, this sample had a low incidence of some transgressive acts, which limited comparisons between types of transgressive acts. Fourth, the sample was composed of veterans who sought C&P examinations, and thus may not be representative of most veterans. Fifth, similar to previous studies, pre-combat data were not available so drawing causal conclusions about the impact of personality traits was limited. Sixth, only single indicators were available for some manifest variables (e.g., guilt) and only one latent variable was measured. Finally, the study data were cross-sectional and not designed to test causal relations between transgressive acts and moral injury outcomes.

Several strengths of the study can be noted. The current study was one of the first to test multiple components of a frequently-cited model of moral injury (Litz et al., 2009) and to expand the model based on relevant literature. This study was the first to examine the associations between transgressive acts and demoralization, and also contributed to the accumulating literature on the unique contribution of transgressive acts to PTSD severity. A multi-method approach was used to identify a variety of transgressive acts,

allowing for a more diverse sample of events than in previous studies. A moral injury outcome (demoralization) and risk factor (aggression) were measured using the MMPI-2 and only valid profiles, as interpreted by licensed psychologists, were analyzed.

An important next step for researchers is to continue empirically testing the moral injury model *in toto*, including more indicators of mechanisms and outcomes. Future studies ought to examine additional moral injury outcomes not included in Litz and colleagues (2009) model, such as substance abuse (Litz et al., 2009), postdeployment violence (Maguen et al., 2009), or loss of spirituality (Drescher et al., 2011). Further investigation is needed to properly conceptualize the moral injury-related variables as mechanisms vs. outcomes; for example, whether demoralization is better conceptualized as a mechanism rather than as a moral injury outcome. Additionally, studies with strong causal designs (e.g., with pre-combat and post-combat measures) are needed to understand the unique impact of transgressive acts. Future studies need to be adequately designed and powered to test complex mediation and moderation models of moral injury.

Overall, these findings speak to the relevance of addressing the impact of transgressive acts and concomitant guilt and shame on combat veterans' long-term functioning. For clinicians, integrating awareness of the impact of transgressive acts and explicitly assessing for and addressing these acts could help veterans move past pervasive hopelessness, despair, and suicidality. Intentionally addressing the transgressive acts could help improve the relatively poorer effectiveness of mainstream trauma-focused treatments in combat-trauma populations compared with civilian populations (Bradley, Green, Russ, Dutra, & Westen, 2005). All veterans who complain of trauma-related

psychological distress and present for treatment at a VA medical center are mandated to have access to a mainstream manualized PTSD treatments such as cognitive processing therapy (CPT) or prolonged exposure (PE). However, these manualized PTSD treatments typically do not address transgressive act-type traumas, and may inadequately address the guilt and shame that feeds the resulting psychological distress (Steenkamp, Nash, Lebowitz, & Litz, 2013, for further discussion). These standard manualized treatments have also been criticized for decontextualizing and pathologizing guilt and shame that may appropriately result from acts of killing or atrocities (Finlay, 2015). Moral injury needs to be considered an expected outcome of participation in combat, particularly guerrilla combat in an urban front where civilians are often brutalized, and not a pathological reaction to war.

Clinicians who work with veterans around transgressive acts and moral injury are encouraged not to devalue the painful guilt and shame reactions that veterans may experience. Instead, clinicians are advised to emotionally prepare themselves for the discomfiting and difficult therapeutic experiences of bearing witness to and empathizing with disturbing and horrific memories of their clients' actions (Haley, 1974). Effective and empathic treatments that address the guilt and shame associated with transgressive acts, particularly those transgressive acts that may arise in the Iraq and Afghanistan wars, are needed to adequately care for returning veterans.

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Table 1

Descriptives of Moral Injury Variables

Variable	Mean	Standard Deviation	Range
Guilt ^a	2.88	1.34	1-5
Aggression ^b	53.50	11.94	33-94
Demoralization ^b	66.71	13.20	37-88
General Combat Exposure ^c	7.80	3.43	0-13
Re-experiencing PTSD Symptoms ^d	13.87	4.52	5-25
Numbing-Avoidance PTSD Symptoms ^d	19.11	6.62	7-35
Hypervigilance PTSD Symptoms ^d	15.81	4.71	5-25
PTSD-Total Symptoms ^d	48.79	14.68	17-84
Suicidality ^a	1.47	.95	1-5

^a From the M-PTSD scale; ^b From MMPI-2, measured as *T*-scores; ^c From DRRI; ^d From PCL-C. *N* = 190.

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Table 2

Correlations among Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1. Combat Exposure	—											
2. Witnessing Comrade's Death	.60**	—										
3. Killing in Combat	.65**	.42**	—									
4. History of Transgressive Acts	.67**	.48**	.72**	—								
5. Guilt	.07	.07	.19*	.21**	—							
6. Aggression	.29**	.12	.17*	.20*	.04	—						
7. Demoralization	-.09	.00	.06	.04	.32**	.08	—					
8. Re-experiencing PTSD Symptoms	.10	.21**	.17*	.23*	.13	.08	.34**	—				
9. Avoidance and Numbing PTSD Symptoms	-.02	.17*	.09	.13	.21**	.01	.49**	.80**	—			
10. Hypervigilance PTSD Symptoms	.04	.15	.17*	.14	.17*	.15	.42**	.77**	.77**	—		
11. PTSD Total Severity	.03	.19**	.15	.17*	.19*	.08	.47**	.92**	.95**	.91**	—	
12. Suicidality	-.08	-.04	.02	.01	.33**	.00	.45**	.25**	.34**	.20**	.30**	—

$p < .05$. ** $p < .01$ ** $N = 190$

Figure 1

Structural Equation Model 1

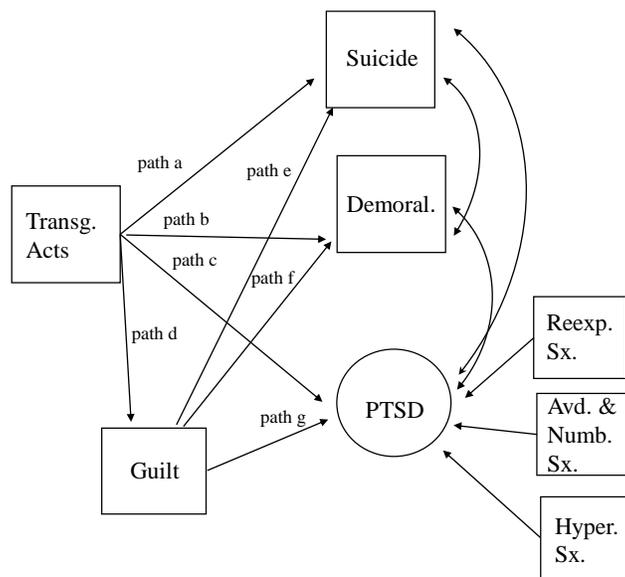


Figure 2

Structural Equation Model 2

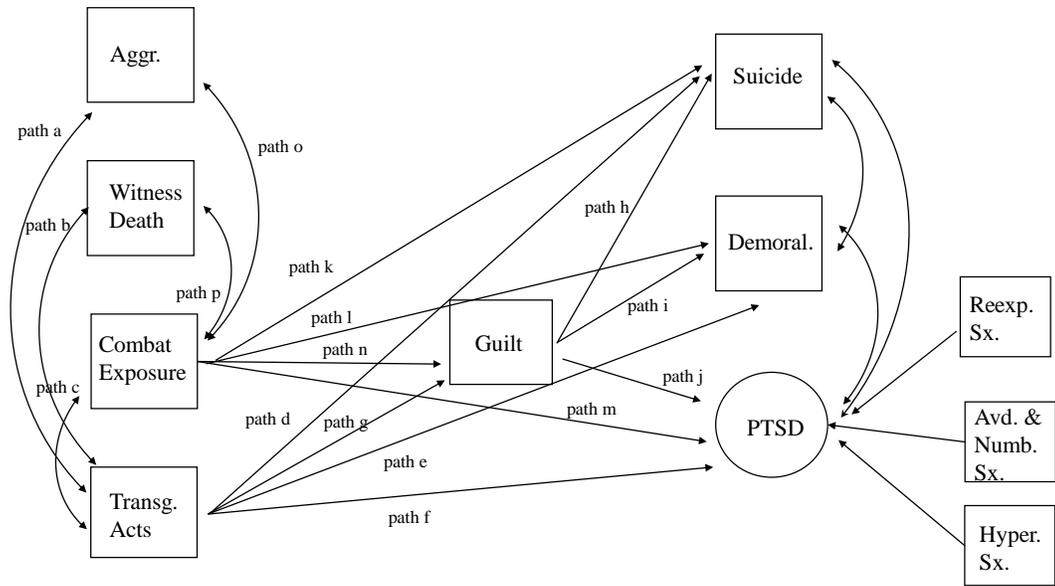


Figure 3

Structural Equation Model 3

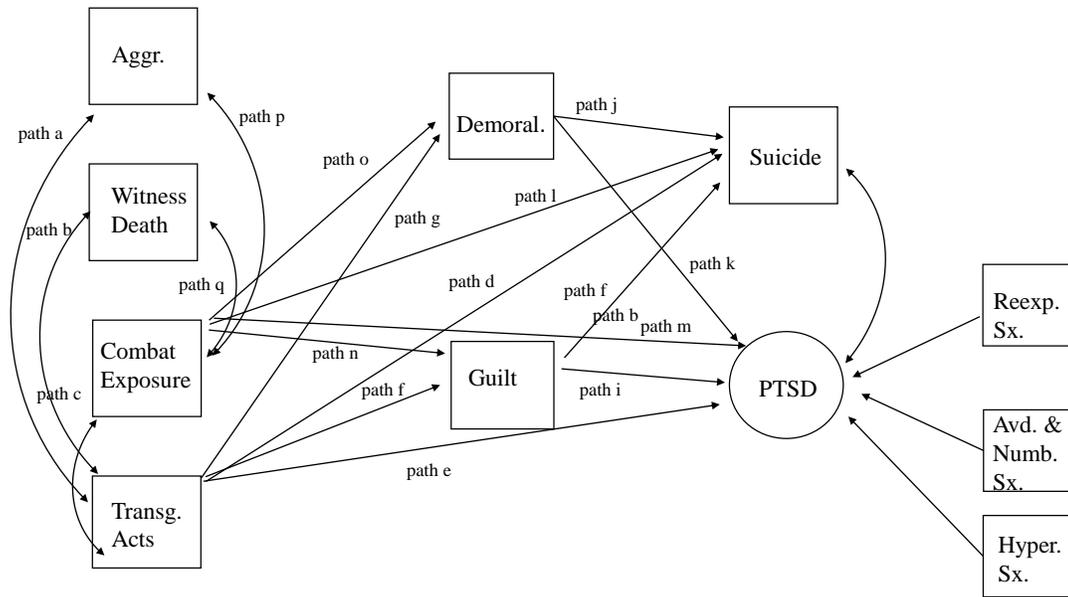
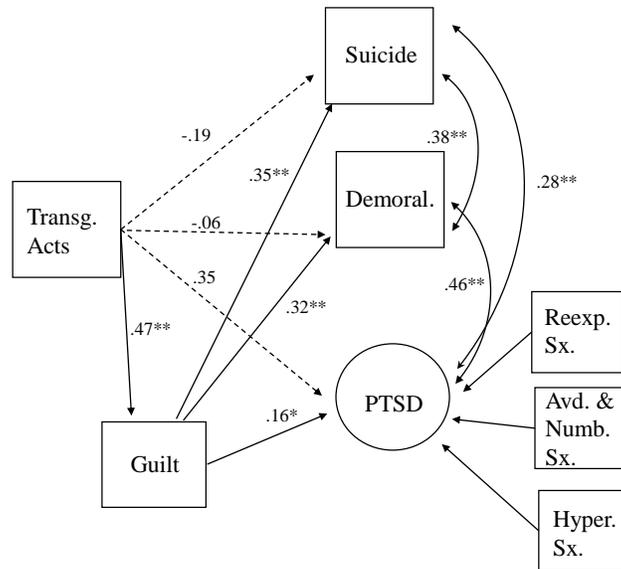


Figure 4

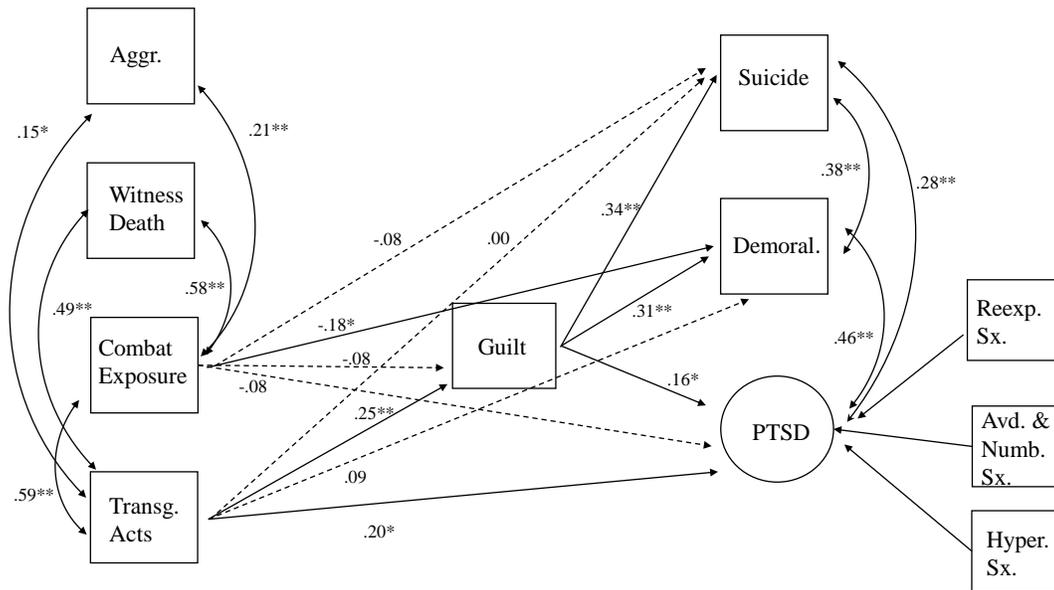
Structural Equation Model 1 with Standardized Coefficients



Note. * $p < .05$, ** $p < .001$. Nonsignificant paths are marked with the dashed line.

Figure 5

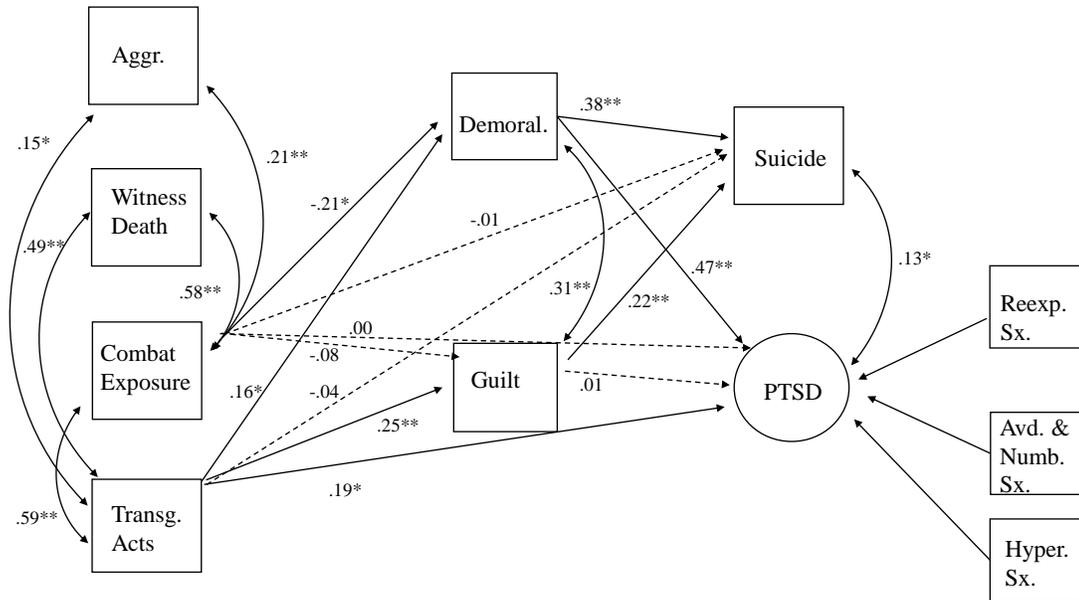
Structural Equation Model 2 with Standardized Coefficients



Note. * $p < .05$, ** $p < .001$. Nonsignificant paths are marked with the dashed line.

Figure 6

Structural Equation Model 3 with Standardized Estimates



Note. * $p < .05$, ** $p < .001$. Nonsignificant paths are marked with the dashed line.

Appendix A³

A Review of Research on Moral Injury in Combat Veterans

Combat can require individuals to violate their consciences repeatedly. For several decades, clinicians have noted the psychological impact on veterans of engaging in killing, committing atrocities, and violating the rules of engagement (Haley, 1974). Despite this clinical attention, most psychological research on veterans' war wounds has focused on Posttraumatic Stress Disorder (PTSD; APA, 2013), a fear-based disorder that results from exposure to life-threatening events, rather than on the consequences of active participation in warfare.

The moral injury syndrome was proposed to describe the constellation of shame and guilt-based disturbances that some combat veterans experience after engaging in wartime acts of commission (e.g., killing) or omission (e.g., failing to prevent atrocities) (Litz et al., 2009). The moral injury syndrome was proposed to be constituted of the PTSD symptoms of intrusive memories, emotional numbing and avoidance along with collateral effects such as self-injury, demoralization, and self-handicapping (Litz et al., 2009; Shay, 1994).

The purpose of this paper is to review the research and clinical literature on moral injury as it has developed since the publication of Litz and colleagues' (2009) seminal article on moral injury. Our goal is to encourage additional research on moral injury that can in turn spur the development of evidence-based interventions. Specifically, we first review definitions of and research on the prevalence of transgressive acts, along with

³ *Note.* This manuscript is currently under review for publication.

research on factors that increase or decrease the risk of transgressive acts. Next, we review the empirical and clinical literature on the relations between transgressive acts and components of moral injury (e.g., self-injury) as well as the proposed mechanisms of moral injury development (e.g., shame). We conclude with directions for future research. Understanding the diverse ways in which returning veterans are affected by their wartime experiences is timely: between 2001 and 2011, approximately 930,000 military personnel (Army, Navy, Marine, Air Force) were deployed to Iraq and Afghanistan for at least one year; at least 50,000 personnel were deployed for four or more years (RAND Corporation, 2013). These veterans require focused attention to their mental health needs (Hoge et al., 2004).

Transgressive Acts in War

Definition of Transgressive Acts

Moral injury was proposed to result from grossly disturbing wartime experiences such as killing or failing to prevent atrocities. Although these experiences are often referred to as “morally injurious experiences” (e.g., Litz et al., 2009), or even “moral injury” (e.g., Farnsworth et al., 2014), these terms confound the act and the outcome and may contribute to tautological assumptions about the impact of these events (e.g., that certain events necessarily cause moral injury). We here use the term “transgressive act” to identify and describe these experiences that involve the violation – or transgression - of accepted boundaries of behavior. Litz and colleagues (2009) offered this preliminary definition of morally injurious experiences (or transgressive acts): “perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply help moral

beliefs and expectations” (p.700). Drescher and colleagues’ (2011) definition emphasized that transgressive acts are “inhumane, cruel, depraved, or violent, bringing about pain, suffering, or death of others” (p. 9). Shay (1994) identified betrayal by a trusted authority figure, such as a commanding officer, as a transgressive act. Like the definition of traumatic events in the criteria for PTSD (APA, 2013), transgressive acts can be directly experienced, witnessed, or learned about. An assumption of the moral injury field is that a transgressive acts can be justified and still be potentially morally injurious, such as killing an enemy combatant (Farnsworth et al., 2014).

Prevalence of Transgressive Acts

The prevalence of the full range of transgressive acts has not been systematically assessed in cohorts of veterans of any war. The data that are available on the prevalence of participation in or exposure to transgressive acts in U.S. military personnel in different war eras are briefly reviewed below. The most recent cohort of veterans from Operation Iraqi Freedom (OIF) in Iraq and Operation Enduring Freedom (OEF) in Afghanistan generally runs a high risk of having engaged in or been exposed to transgressive acts. This risk was likely heightened because combat was against insurgent forces using guerilla tactics in urban/close quarters (Farnsworth et al., 2014). Across two samples, approximately 40-50% of OIF Soldiers and 65% of OIF Marines reported killing an enemy combatant (Hoge et al., 2004; Maguen et al., 2010). Additionally, 12-15% of OIF Soldiers and 28% of OIF Marines reported killing a noncombatant (Hoge et al., 2004). A RAND Corporation survey of OIF and OEF veterans found that 9.5% reported participating in hand-to-hand combat, 5% reported being directly responsible for deaths

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of civilians and 5% reported witnessing brutality toward civilians (Schell & Marshall,
2008).

Vietnam veterans, similar to OIF/OEF veterans, have a high risk of some transgressive acts. Population-based estimates of transgressive acts were derived from the nationally-representative National Vietnam Veterans Readjustment Survey (NVVRS; Maguen et al., 2009). Approximately 41% of Vietnam veterans believed they had killed an enemy combatant; 13% reported they were involved in a situation where a woman, child, or elder was injured or killed; and 7% reported they were personally responsible for the death of a Vietnamese civilian. A reanalysis of the NVVRS data found that 41% of Vietnam veterans reported witnessing or participating in atrocities (Currier, Holland, Jones & Sheu, 2014).

Little data were found on the prevalence of transgressive acts in veterans of other wars. Two studies of Gulf War veterans (Carney et al., 2003; Maguen et al., 2011b) both found that 11% reported killing enemy combatants and 19-22% witnessed a death firsthand. No data on rates of transgressive acts were found for Korean War, WWII, or WWI veterans.

In sum, the risk of transgressive acts varies between eras, theaters of combat, branches of military service, and particular acts assessed. However, studies across branches and eras have not assessed the same events, complicating comparisons. The rates of some putative transgressive acts, such as witnessing transgressive acts, betrayal by a commanding officer, or participation in a friendly fire incident, also have not been systematically assessed.

Measures of transgressive acts. In their review, Litz and colleagues (2009)

called for the development of measures to assess engagement in and exposure to transgressive acts. In response, two measures have been developed: the Moral Injury Events Scale (MIES; Nash et al., 2013), and the Moral Injury Questionnaire-Military Version (MIQ-M; Currier et al., 2015). Both the MIES and the MIQ-M assess committed or witnessed transgressive acts and perceived betrayal by others. The MIQ-M assesses both causes (“I saw/was involved in the death(s) of children”) and effects (“I feel guilt for surviving when others didn’t”) of transgressive acts.

Initial psychometric testing of both the MIES and MIQ-M demonstrated adequate psychometric properties of scores in samples of active duty military personnel, recently returned veterans, and treatment-seeking veterans (Currier et al., 2015; Nash et al., 2013). For example, scores on the MIES demonstrated good internal consistency and the two-factor structure was cross-validated in a separate sample (Nash et al., 2013). Scores on the MIES and MIQ-M were significantly positively correlated with measures of distress, supporting convergent validity.

One issue with both the MIES and the MIQ-M is that they tend to confound exposure to transgressive acts with the outcomes of exposure. Although this is explicitly noted in the description of the MIQ-M, a total score was reported that combined items assessing causes (14 items) and effects (6 items). The MIES also assesses both “causes” (“I saw things that were morally wrong”) and effects (“I am troubled by having witnessed others’ immoral acts”) on the same items. Assessing causes and effects on the same items implies connections between the two that may not be present. Analyses that

separate the “causes” and “effects” items on the MIQ-M or new measures of transgressive acts that are not confounded with outcomes would be useful. Finally, because committing transgressive acts may have different effects than witnessing transgressive acts (Farnsworth et al., 2014), a measure that separately assesses these experiences would be useful.

Risk and Protective Factors for Transgressive Acts

A number of risk (i.e., combat exposure) and protective (e.g., military training and leadership) factors for transgressive acts have been proposed (Litz et al., 2009). The limited available data on these factors are reviewed below. Understanding these factors could both reduce the risk of transgressive acts and help clinicians identify combatants who have committed or experienced transgressive acts and might therefore be at higher risk of moral injury.

Research to date suggests that combat exposure and deployment length reliably increase the risk of transgressive acts. For OIF veterans, greater combat exposure was significantly correlated with killing in combat (Maguen et al., 2010); for Vietnam veterans, it was significantly correlated with killing in combat (Maguen et al., 2009), participating in atrocities (Hiley-Young et al., 1995), and harming civilians (Dohrenwend et al., 2013). The U.S. Office of the Surgeon General found that OIF/OEF Soldiers and Marines with heavy combat exposure *and* who had experienced either casualties in their unit *or* handled dead bodies were significantly more likely to report unethical behavior toward noncombatants (Army, 2006).

Contextual factors such as leadership and training in battlefield ethics may decrease the risk of violating rules of engagement. For example, Soldiers and Marines who reported better leadership were less likely to report modifying rules of engagement during conflicts (Castro & McGurk, 2007); conversely, 33% of Soldiers and 29% of Marines reported that their noncommissioned officers did not clearly disavow unnecessary harm to noncombatants. However, the relation between engaging in transgressive acts and violating rules of engagement remains unclear. For instance, killing an enemy combatant is generally considered a transgressive act, but it may not violate rules of engagement (Farnsworth et al., 2014). More clarity on the distinctions between modifying/ violating rules of engagement and committing transgressive acts is needed.

The associations between precombat personality variables, particularly anger/ aggressiveness, and transgressive acts are unclear given the dearth of precombat or premilitary personality data. In one study, the relations between three personality traits (disconstraint, neuroticism, and aggression), combat exposure, and participation in atrocities were examined in a large sample of Vietnam Army and Marine veterans (Holowka et al., 2012). The relation between aggressiveness and participation in atrocities was fully mediated by combat exposure, such that aggressiveness was associated with combat exposure, which in turn was associated with involvement in atrocities. Disconstraint (i.e., tendency toward impulsivity and risk-taking) was directly, and neuroticism was both directly and indirectly (via combat exposure), associated with participation in atrocities. Three studies showed a consistent relation between anger,

Killgore et al., 2008; Maguen et al., 2010); however, anger was conceptualized as an outcome rather than as a predictor of engaging in transgressive acts in these studies. Finally, in a qualitative study 13% of OIF and OEF veterans ($N = 24$) attributed their postdeployment anger to transgressive acts (e.g., betrayal by chain of command; Worthen & Ahern, 2013).

Shay (1994), drawing on his clinical expertise with Vietnam veterans, found that extreme anger can manifest as a “berserker” state during combat. A “berserker” state is speculated to be a combination of grief at the loss of a close comrade and feeling betrayed by authorities. “Berserker” combatants descend into a “beastlike, godlike, socially disconnected...*enraged*, reckless” state (Shay, 1994, p. 82). One attempt was made to assess the “berserker” state using NVVRS data (Fontana & Rosenheck, 1999): Witnessing the death of a close comrade was significantly associated with killing others and indirectly related to committing atrocities (through its positive association with killing others). Farnsworth and colleagues (2014) also speculated that losses within combat units may prompt strong moral emotions (e.g., contempt) that increase the likelihood of abusive violence. Because all of the above studies were cross-sectional and personality was not assessed predeployment, it is unclear whether, for example, dispositional anger/aggressiveness increased the risk of participating in transgressive acts, or if committing transgressive acts led to anger and aggressiveness, or both (Farnsworth et al., 2014).

Moral Injury Following Transgressive Acts

The lived suffering of moral injury was conceptualized by Litz et al. (2009) as a constellation of PTSD symptoms (i.e., intrusions, avoidance, and numbing) and collateral effects (i.e., self-injury, demoralization, and self-handicapping). Self-injurious behaviors include substance abuse, risk-taking, and suicidality. Demoralization is an affective and cognitive phenomenon that manifests as despair, worthlessness, and meaninglessness. Self-handicapping involves shunning positive experiences, such as success or positive emotions.

Most research on transgressive acts has focused on whether killing and/or participating in atrocities predicts PTSD over and above traumas that involve life threat and general combat exposure. Several studies have shown that killing in combat significantly predicted PTSD symptoms after controlling for combat exposure in samples from the Vietnam War, the Gulf War, and the Iraq War (e.g., Fontana & Rosenheck, 1999; Maguen et al., 2009, 2010, 2011b), underscoring the importance of transgressive acts in understanding veterans' mental health. Additionally, shame and guilt (key mechanisms in the moral injury model) have been associated with more severe PTSD among samples of Vietnam War veterans (Beckham, Feldman, & Kirby, 1998; Currier et al., 2014) and Korean War and WWII veterans who were former prisoners of war (Leskela, Dieperink, & Thuras, 2002).

Although research on the relations between transgressive acts and PTSD symptom clusters was reviewed by Litz and colleagues (2009), the collateral effects of self-injury, demoralization, and self-handicapping were only briefly mentioned. To guide continuing investigations on moral injury and the development of interventions, we next review

empirical and clinical literature on the relations between transgressive events and the moral injury collateral effects, and then the proposed mechanisms of moral injury development.

Litz and Colleagues' (2009) Formulation of Moral Injury Collateral Effects

Transgressive acts and self-injurious behaviors. Five studies have examined whether transgressive acts were associated with greater substance abuse, one form of self-injurious behavior (Currier et al., 2014; Killgore et al., 2008; Maguen et al., 2011b; Wilk et al., 2010; Yager et al., 1984). Killing in combat was associated with postdeployment alcohol abuse even after controlling for combat exposure and prior problematic alcohol use among Gulf War veterans (Maguen et al., 2011b) and OIF Soldiers (Killgore et al., 2008). Participating in or witnessing atrocities were associated with higher risk of postdeployment substance abuse among Vietnam veterans (Currier et al., 2014; Yager et al., 1984) and OIF Soldiers (Wilk et al., 2010). Thus, existing research does suggest a relation between transgressive acts and substance abuse. However, the direction of the relation is unclear: Combatants with substance abuse problems may also be more likely to experience transgressive acts. Also, clinicians have noted that some veterans with transgressive act exposure avoid substance use altogether due to concerns about losing control while intoxicated (Shay, 1994), suggesting that there may be different patterns of substance use after transgressive acts.

Available data support the proposition that transgressive acts are associated with suicidality, the most direct form of self-injury. In the NVVRS sample, Vietnam veterans who reported more types of killing experiences (i.e., killing enemies, prisoners, or

civilians) had double the risk of suicidality compared with veterans reporting few or no killing experiences (Maguen et al., 2012). Among a large sample of OIF veterans, killing in combat was indirectly associated with a desire for self-harm and suicidal ideation; PTSD symptoms and depression mediated this relation (Maguen et al., 2011a). In the development of the Moral Injury Questionnaire-Military version (Currier et al., 2015), MIQ-M scores were associated with greater suicide risk in regression analyses controlling for other factors but the bivariate correlation was not significant. In a study of the relation between transgressive acts and suicidality, Air Force and Army personnel with a lifetime history of suicide attempts ($n = 11$) had significantly higher MIES scores than personnel with no history of suicidality ($n = 106$) (Bryan, Bryan, Morrow, Etienne, & Ray-Sannerud, 2014). In general, the associations between transgressive acts and suicidality tended to be small across studies. This may be due to the overall low incidence of suicidality in the samples; for example, only 2.8% of Iraq veterans examined by Maguen et al., (2011a) reported suicidal ideation. Future studies would benefit from identifying samples of suicidal veterans to assess whether they have higher rates of exposure to transgressive acts than do nonsuicidal veterans.

Risk-taking was also proposed to be a form of self-injury due to moral injury (Litz et al., 2009). One study examined the relations between violent combat exposure, various transgressive acts, and postdeployment risk-taking behaviors among a large sample of OIF Soldiers (Killgore et al., 2008). Killing in combat was associated with postdeployment risk-taking propensity; however, these findings should be interpreted cautiously because the effect sizes were quite small. Additionally, the effect sizes of the

associations between transgressive acts and risk taking were generally the same as those between violent non-transgressive acts and risk-taking, suggesting that risk taking may not be uniquely related to transgressive acts and can have other motivations besides self-injury.

Transgressive acts and demoralization. Demoralization is the phenomenon of feeling an “inability to cope” (Clark & Kissane, 2002, p. 733), hopelessness, and helplessness; a demoralized person descends into existential despair and meaninglessness (Parson, 1990). Although often experienced concurrently with depression, demoralization may be uniquely associated with transgressive acts. For instance, in a large community sample, hopelessness predicted suicidality more strongly than did depression (Kuo, Gallo, & Eaton, 2004).

Clinical literature has pointed to posttraumatic demoralization as a significant manifestation of suffering for veterans (Parson, 1990); however, no empirical studies were identified that compared rates of demoralization in combat veterans with and without transgressive acts. Additional research is needed to understand whether demoralization is better understood as a mechanism that increases the risk of other collateral outcomes such as self-injury rather than as an independent outcome. For example, hopelessness (a component of demoralization) is also a risk marker for suicidality among veterans with direct combat exposure (Bryan, Ray-Sannerud, Morrow, & Etienne, 2013). Future research also can explore whether demoralization is experienced at different rates relative to the type of transgressive act experienced. For

instance, being unable to prevent a comrade from dying may induce more demoralization than killing.

Transgressive acts and self-handicapping behaviors. According to the moral injury model (Litz et al., 2009), veterans respond to their own transgressive acts by self-handicapping; that is, by acting in ways that undermine their own well-being and engagement in life. Substance abuse was speculated to have a maladaptive function similar to self-handicapping among veterans with moral injury (Currier et al., 2014). A thorough search of the literature found no studies of self-handicapping in response to transgressive acts, to combat, or in veteran populations more broadly.

Mechanisms of moral injury. The moral injury syndrome was proposed by Litz and colleagues (2009) to result from the dissonance generated from the discord between transgressive acts and long-held beliefs about one's basic moral worth and the goodness of the world. If this dissonance, or internal moral conflict, gives rise to stable, internal, and global negative attributions about the causes and meaning of a transgressive act (e.g., it was due to character flaws, the veteran is tainted), then these attributions will lead to long-lasting shame, guilt, and a fear of being judged. If these moral emotions and fear of judgement lead to social withdrawal, then the veteran will lose supportive interactions, opportunities to disconfirm the shame- and guilt-based beliefs of being unforgivable, and thereby reinforce self-condemnation.

Few studies have examined the relations between transgressive acts and these proposed mechanisms or the relations between these mechanisms and moral injury collateral effects. One study reported a relation between transgressive acts and guilt and

shame (Fontana, Rosenheck, & Brett, 1992). Another study established a strong association between exposure to atrocities, guilt, shame, and the re-experiencing and avoidance symptoms of PTSD (Beckham, Feldman, & Kirby, 1998) but the associations with the collateral effects of moral injury (e.g., self-injury) were not examined. Although no research was found that tested whether transgressive acts were a risk factor for social withdrawal specifically, transgressive acts were associated with diminished social support and increased social problems (King, King, Fairbank, Keane, & Adams, 1998). To date, other important factors such as attributions and self-condemnation have not been studied in veterans with a history of transgressive acts.

Few studies have conducted integrative tests of the moral injury model by examining the relations between transgressive acts and relevant outcomes, and the mechanisms proposed to account for these relations (e.g., guilt, shame, social withdrawal) in one model. One study (Hendin & Hass, 1991) that examined the relation between transgressive acts, peri-combat experiences, and self-injury found that 93% of *suicidal* veterans who had killed civilians reported being in a berserker state (e.g., out of control because of loss and/or fear) at the time. In comparison, only 43% of *non-suicidal* veterans who had killed civilians reported being in a berserker state, suggesting relations among transgressive acts, anger, and suicidality. Another study assessed the relation between involvement in atrocities, combat-related guilt, suicidality, and substance abuse in Vietnam veterans using NVVRS data (Currier et al., 2014). Wartime participation in atrocities was directly and indirectly (via PTSD) associated with postdeployment substance abuse and suicidality, and was also directly associated with combat-related

guilt. However, combat-related guilt did not mediate the relation between participation in atrocities and outcomes, contrary to the moral injury model (Litz et al., 2009).

Other Diagnoses Related to Moral Injury

In addition to the moral injury model, the diagnosis of Enduring Personality Change after Catastrophic Experience (EPCACE, *International Classification of Mental and Behavioral Disorders, ICD-10*, 1993) may be useful for understanding how transgressive acts affect veterans. The EPCACE diagnosis describes prominent posttrauma personality changes not fully captured by the PTSD diagnosis (Beltran, Llewellyn, & Silove, 2008), and include: “a hostile or mistrustful attitude towards the world, social withdrawal, feelings of emptiness or hopelessness, chronic feeling of being ‘on the edge’, and estrangement” (WHO, 1993, pp. 129-130). Some EPCACE symptoms parallel components of moral injury: Emptiness, hopelessness, and estrangement in EPCACE are also components of demoralization. Social withdrawal was identified both as a mechanism of moral injury and as a symptom of EPCACE. Very little research on EPCACE in combat veterans has been conducted, although some clinicians who work with Vietnam veterans have stated that this diagnosis is useful and face valid (Beltran et al., 2008). EPCACE’s conceptual contribution to the moral injury field may lie in suggesting additional symptoms or features that are associated with transgressive acts.

Discussion

The purpose of this paper was to review research on the prevalence of transgressive acts, factors that increase or decrease risk of exposure to transgressive acts, and the relations among exposure to transgressive acts and moral injury collateral effects

(e.g., self-injury) as well as the proposed mechanisms of moral injury genesis (e.g., shame). Below, we briefly highlight some of the primary conclusions of our review, and offer some recommendations for future research and interventions for veterans suffering with moral injury.

Key Conclusions from Review

Many combat veterans are at risk of transgressive act exposure and the postdeployment suffering that sometimes follow these experiences. A significant percentage of U.S. Armed Forces have reported participation in or exposure to transgressive acts during combat from the Vietnam War (the first conflict after which veterans were surveyed about their experiences) onwards. The current cohort of Veterans runs a high risk of transgressive act exposure, perhaps because of the unique nature of these conflicts.

A number of protective and risk factors have been proposed to influence the likelihood of exposure to transgressive acts. There is the most consistent evidence for combat exposure and deployment length as risk factors. Although combat exposure may be unavoidable, deployment length could be reduced, both in terms of length of single deployments and number of deployments, which may in turn reduce the risk of transgressive acts. Other structural changes, such as better leadership and training in battlefield ethics, may lower the risk of some transgressive acts, although data on this are limited. Finally, although anger and aggression are associated with transgressive acts, the direction of the relation between transgressive acts and anger/aggression is unclear because of the lack of predeployment data. Data collected during deployment would also

be useful because it has been speculated that anger and grief over the loss of close comrades may bring about a “berserker” state in some military personnel. During this state, combatants are thought to be at higher risk of committing transgressive acts.

Clinical and empirical work is beginning to identify the effects of transgressive acts. There is compelling evidence that transgressive acts are associated with greater PTSD risk, even after controlling for combat exposure. Of the collateral effects outlined in the moral injury model, there is the strongest support for the relation between transgressive acts and substance abuse (an aspect of self-injury). Participation in transgressive acts is also associated with increased risk of suicidality although this relation tends to be small. Although clinical accounts have identified demoralization and self-handicapping in veterans with transgressive acts, no research evidence was found. Finally, risk-taking seems to follow both transgressive acts and violent non-transgressive acts. In sum, much more information is needed on the associations between transgressive acts and postdeployment mental health and functioning.

The moral injury syndrome was proposed to result from the cascading effects of social withdrawal and self-condemnation following the guilt and shame veterans experience after transgressive acts (Litz et al., 2009). Both clinical expertise and one empirical study have identified a strong association between guilt and shame and transgressive acts. Clinical data support the putative link between transgressive acts, social withdrawal, and subsequent self-condemnation (e.g., Worthington & Langberg, 2012) but, again, research on these mechanisms is lacking.

Directions for Future Research

Given the overall dearth of research on moral injury, there are many gaps in the literature. Here we highlight some ideas for future research in the four areas covered by our review (i.e., definitions and prevalence of transgressive acts, risk and protective factors for transgressive act exposure, the proposed collateral effects of moral injury, and the mechanisms linking transgressive acts to moral injury outcomes).

First, improved measures of transgressive acts are needed. As mentioned previously, the two existing measures (Carrier et al., 2015; Nash et al., 2013) both tend to confound exposure to transgressive acts with the potential outcomes of transgressive acts (e.g., guilt). It is difficult to test models of moral injury that posit links between transgressive acts and guilt if our measures of transgressive acts also measure guilt. It would also be helpful to have measures of transgressive acts that distinguish between different kinds of exposures (i.e., direct involvement in atrocities vs. witnessing atrocities vs. betrayal by an officer) because these different types of exposures may be associated with different outcomes (Farnsworth et al., 2014). Such measures would also allow us to assess the relations among different types of transgressive acts. For example, Shay (1994) speculated that betrayal by commanding authorities erodes unit cohesion, military effectiveness, and the safety and security of combat personnel. Such a betrayal thus may place combatants at risk of other transgressive acts (e.g., killing, committed atrocities).

Additional conceptual and empirical research is needed to clarify the definition of a transgressive act. The moral injury field could benefit from the debate around “bracket creep” (i.e., the expansion of events considered traumatic) that has occurred in the PTSD field (e.g., Spitzer, First, & Wakefield, 2007) in terms of setting the threshold for what is

considered a transgressive event. The prevalence of exposure to a full range of transgressive acts among veterans from different eras, combat theaters, and branches of service, and the relations between these transgressive acts and indicators of moral injury needs to be systematically assessed.

Second, more research is needed on risk and protective factors for transgressive act exposure. For example, interdisciplinary research is needed on the kinds of leadership and training that would effectively promote battlefield ethics and prevent moral injury. Although combat exposure is perhaps inevitable, better leadership and training may help protect against some transgressive acts (e.g., killing enemy combatants) that accompany combat exposure. To disentangle the causes and effects of transgressive acts, it would be most useful to gather data on risk and protective factors *prior* to deployment (see Polusny et al., 2011, for an example).

Third, additional research is needed on the proposed collateral effects of exposure to transgressive acts beyond PTSD symptoms. Despite that Litz and colleagues' (2009) paper has been widely cited, little research has examined the collateral effects outlined in that model in relation to transgressive acts. Other aspects of moral injury not described by Litz and colleagues also should be examined, such as spiritual/existential problems and loss of faith (Drescher et al., 2011; Farnsworth et al., 2014). Studies that comprehensively assess the collateral effects would allow for further clarification regarding the interrelatedness of the manifestations of moral injury.

Fourth, studies are needed that test more complex models that include mediators and moderators of the relations between transgressive acts and the collateral effects of

moral injury and PTSD symptoms. Studies that assess mediation should be designed to provide strong tests of implied claims of causality in mediation models (e.g., by collecting data longitudinally pre- and postdeployment). In particular, further research is needed regarding the unique experiences of combat-related guilt and shame versus non-combat related guilt and shame and to distinguish between context-specific guilt, generalized guilt, and shame (Farnsworth et al., 2014).

Additional mechanisms of moral injury have emerged in recent research and warrant investigation. Meaning-making about the transgressive act (a cognitive process focused on values and beliefs) has received some support as a potential mechanism of moral injury (Currier, Holland, & Malott, 2015b). Other moral emotions such as disgust, contempt (e.g., Farnsworth et al., 2014), and embitterment (Linden, 2003) should also be investigated. Research also is needed on the attributions veterans make about transgressive acts, which play a key role in the moral injury model but have not been investigated. Finally, Litz and colleagues (2009) proposed factors that may moderate the relation between transgressive acts and moral injury (e.g., self-esteem) and that need to be examined empirically.

In general, research on transgressive acts and moral injury is complicated by the lack of conceptual clarity regarding causes, mechanisms, and outcomes. We have previously mentioned that measures of “morally injurious experiences” assess both acts and outcomes. Similarly, it is unclear whether factors like anger are risk factors for transgressive acts or outcomes of transgressive acts, or both. The proposed mechanisms of moral injury (e.g., guilt, shame, withdrawal, self-condemnation) also overlap with the

collateral outcomes (i.e., self-handicapping, demoralization, self-injury). And, the proposed collateral effects are themselves very interrelated. For example, substance abuse can be conceptualized as self-injury or as self-handicapping. To complicate matters further, the components of moral injury appear to occur in an additive feedback loop (e.g., demoralization and suicidality). Strong research designs, including longitudinal and mixed methods studies, are needed to untangle these relations.

Interventions for Moral Injury

Veterans who experienced transgressive acts may suffer from a shame/guilt-based syndrome (i.e., moral injury) in addition to a fear-based disorder (i.e., PTSD). Indeed, cognitive-behavioral PTSD interventions that are effective in civilian populations have smaller effect sizes in veteran populations (Bradley, Green, Russ, Dutra, & Westen, 2005) and have been criticized as inadequately addressing guilt and shame (see Steenkamp, Nash, Lebowitz, & Litz, 2013, for further discussion). Furthermore, it has been suggested that exposure-habituation models of PTSD treatment may exacerbate shame-based reactions to transgressive events, be less effective, and lead to treatment refractoriness (Maguen & Burkman, 2013).

Recently, two brief manualized interventions that address moral injury have been developed for military personnel. The first is Adaptive Disclosure (AD), a 6-session individual cognitive-behavioral-Gestalt intervention that promotes self-forgiveness and compassion developed for active-duty military personnel (Gray et al., 2012). AD involves first disclosing the transgressive event narrative in a safe therapeutic environment, and then participating in a therapist-facilitated imaginal dialogue with a forgiving and

compassionate moral authority about the transgressive event and the harmed it has caused

(e.g., self-injury). Active duty Marine and Navy Corps personnel ($N = 44$) who participated in a pilot study of AD reported significant reductions in scores on measures of PTSD and depression from pre- to post-treatment.

The second program, Building Spiritual Strength, is an 8 session group therapy for use in faith-based settings for military personnel suffering with spiritual distress (Harris, Park, Currier, Usset, & Voecks, 2015). One case study describing the application and successful treatment of a young religious OIF veteran provided some promising support for this community-based intervention. Development of additional interventions that treat moral injury with and without co-occurring PTSD is an important next step in delivering adequate care to combat veterans.

Conclusions

Moral injury is a construct used to help explain veterans' experiences and is clinically recognized by providers who treat combat veterans. We hope that this review will spur additional research on moral injury that will then lead to new interventions addressing the unique issues that can arise for veterans who have committed or been exposed to transgressive acts.

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Appendix B

Coding Procedure

Participants were identified through an iterative process. The first step was an initial review of 134 participants' C&P exams. The purpose of this initial review was to confirm that the narrative portion of the C&P examinations held information about transgressive acts, and to gain familiarity with the dataset to determine a method of coding narrative data. The output of this review was brief notations about the potentially traumatic and/or transgressive events in the sample. Approximately 25% ($n = 34$) of the participants reported a transgressive act. Second, I examined a larger subsample of 468 participants from the parent study that were likely to have completed a C&P examination. I read through each participant's medical chart and identified 317 participants with C&P examinations. During this stage, participants were dropped from the study for two reasons: psychological assessment data were not available or the participant's primary diagnosis was traumatic brain injury ($n = \sim 4$). Third, I extracted and de-identified the trauma narratives of these 317 participants and distributed them to a coding team of three doctoral-level and masters-level trauma experts at the Brain Science Center at the Minneapolis VAMC.

Coding Narrative Data from Compensation and Pension Exams. In order to complete data preparation, a coding manual for the C&P trauma narratives was created. The transgressive acts were previously identified by clinical and empirical literature as likely precipitants of moral injury (Litz et al., 2008; Maguen et al., 2009; Shay, 1995).

Fear-based traumas were coded if they appeared in the C&P exam, although they were not used in the analyses.

Dr. Syed, a dissertation committee member, was consulted during the creation of the coding manual and contributed feedback to improve the descriptive anchors. The coding manual was created in an iterative process with consultation with Dr. Syed and the three Ph.D. level psychologists who coded the events. The coders were two senior psychologists and one postdoctoral psychology research fellow at the Brain Science Center, at the Minneapolis VAMC. The two senior psychologists were primary investigators on the larger study in which the current study is based.

The initial coding manual included 13 transgressive acts categories and three non-transgressive act categories (e.g., fear-based traumas). The original 13 transgressive acts were derived from empirical literature (e.g., Maguen et al., 2009), clinical accounts from a combat-related PTSD experts (Drescher et al., 2011; Shay, 1994), and the moral injury model paper (Litz et al., 2009). The three non-transgressive act categories were broad descriptors of traumatic events that were commonly recounted in C&P examinations. In the initial round of training, coders coded 20 cases. In this first round, the coders reviewed the entirety of the C&P exam to identify and code potential traumas. During this round of coding, interrater agreement was poor. Coders provided constructive feedback about the process: first, that reading each C&P examination in its entirety was prohibitively time consuming, and second, reading the examination in its entirety would also contribute to poor interrater agreement. The coding manual was also revised to incorporate discussions during training sessions with the expert coders. One category was

dropped because the prevalence in the sample was most likely nil (i.e., betrayal by a commanding officer). One category (luck leading to death of a comrade; from Shay, 1995) was found to be too vague and difficult to identify. One category (learning about/failing to prevent/witnessing atrocities/massacre) was added because of the expectation of low prevalence of the original atrocity-related category (committing a massacre). The final coding manual included 12 transgressive acts (witnessing/failing to prevent death of a comrade, witnessing/learning about suicide of comrade, learning about death of a comrade, witnessing/failing to prevent injuries/harm to noncombatant, killing enemy combatant, injuring/killing noncombatant/women and children, committing a massacre of civilians, learning about/failing to prevent/witnessing atrocities/massacre, friendly fire, committing/witnessing/learning about fragging [i.e., assassination or attempted assassination of one military personnel by another military personnel], witnessing/handling dead bodies, vague statement of commission) and six non-transgressive traumas (military sexual abuse, childhood sexual abuse, childhood physical abuse, adult sexual abuse, combat fear-based stressor, non-combat fear-based stressor).

I consulted with the expert coders about strategies for decreasing the time spent on coding and improving agreement between raters. In consultation with coders including subject matter expert Dr. Engdahl (who was also a coder), I decided that I would extract the relevant trauma/transgressive act narratives from the C&P examinations and coders would identify the type of trauma or transgressive act the participant described. Thus, coders would be using narrative excerpts, rather than the full C&P examination for coding. Dr. Engdahl and I agreed that the traumatic narratives were easily identified

because the C&P examinations were formatted to clearly identify three military traumas as the anchor event for the PTSD diagnostic interview.

Prior to extracting the trauma narratives from the C&P examinations, I performed a reliability check on the identification of the trauma narratives, in short whether two independent trauma expert readers would identify the same narrative snippets in the same C&P exams. Both the author and one of the senior psychologist coders reviewed four cases, independently gleaned the trauma narratives, and compared our selections. On the first round, we identified approximately 56% of the same traumas (7/12). Because of this low interrater agreement, an additional 21 cases were reviewed; during the second round, 90% (46/51) of the same traumas were identified by both coders. I subsequently read each participant's C&P examinations ($N = 317$) and extracted the trauma narratives. To protect the confidentiality of the participants, all narratives were de-identified.

The coding team went through a second round of coding training using the de-identified trauma narratives and the revised coding manual. During this round of training, each coder coded 15 narratives. The interrater agreement was much improved during this round: for the transgressive acts, Cronbach's $\alpha = .71-1.00$; for the non-transgressive traumas, Cronbach's $\alpha = .66-1.00$. One category of transgressive act (learning about death of a comrade) demonstrated very poor interrater agreement (Cronbach's $\alpha = -.15$); this category was dropped from subsequent analyses. A total of 317 participants' trauma narratives were coded.